

## SOVIET MATHEMATICS — DOKLADY

Volume 44, Number 1

January-February 1992

### CONTENTS

Basalikas, A. <i>Limit theorems for random polynomial forms</i> .....	1
Bakhvalov, N. S. and Knyazev, A. V. <i>An efficient iterative method for solving the Lamé equations for almost incompressible media and Stokes' equations</i> ..	4
Vakhrameev, S. A. <i>The Lyusternik-Shnirel'man theory for transversally convex subsets of Hilbert manifolds, and its applications in optimal control theory</i>	10
Vlasov, V. V. <i>On the solvability of a class of functional-differential equations on a semiaxis, and some spectral questions</i> .....	14
Gurvich, V. A. and Libkin, L. O. <i>Quasiconvex analysis on semilattices, and absolutely determined matrices</i> .....	20
Dzhuraev, A. <i>On the statement of space elliptic boundary value problems for systems</i> .....	26
Kostin, V. A. <i>On exactly uniformly well-posed solvability of the Cauchy problem</i>	32
Krotov, V. G. <i>A sharp estimate of the boundary behavior of functions in the Hardy-Sobolev classes <math>H_\alpha^p(B^n)</math> in the critical case <math>\alpha p = n</math></i> .....	36
Mikhailov, L. G. <i>On some singular partial differential equations</i> .....	40
Nikol'skii, S. M. <i>Approximation of functions of Besov class on a manifold by entire functions of exponential type</i> .....	47
Omarov, A. I. <i>A syntactical description of filtering formulas</i> .....	53
Sadovnichii, V. A. and Dubrovskii, V. V. <i>A classical regularized trace formula for the eigenvalues of the Laplace-Beltrami operator with a potential on the sphere <math>S^2</math></i> .....	56
Samoilenko, A. M. and Ilolov, M. <i>On the theory of evolution equations inhomogeneous in time and with impulsive actions</i> .....	59
Skrypnik, I. V. <i>Regularity of a boundary point for a quasilinear parabolic equation</i> .....	64
Tolstykh, A. I. <i>On a class of noncentered compact difference schemes of fifth order, based on Padé approximants</i> .....	69
Fam Khy-u T'ep [Pham hü'u Tiêu] <i>A reduction theorem for invariant lattices of type <math>A_n</math></i> .....	75
Fursikov, A. V. <i>The problem of closure of chains of moment equations corresponding to the three-dimensional Navier-Stokes system in the case of large Reynolds numbers</i> .....	80
Amirov, R. Kh. <i>A multidimensional inverse problem for a hyperbolic equation, and a spectral problem connected with it</i> .....	86

Balashova, G. S. <i>Extension and imbedding theorems for Sobolev spaces of infinite order</i> .....	88
Bulavskii, Yu. V. <i>A general scheme for constructing randomized methods of solution for integral equations</i> .....	92
Vasil'chik, M. Yu. <i>On traces of functions from a Sobolev space defined in a plane domain with non-Lipschitz boundary</i> .....	96
Lyashenko, A. A. <i>On completeness of a system of generalized eigenfunctions of an operator generated by the first boundary value problem for an equation of S. L. Sobolev</i> .....	100
Nguen Tkhi Tkheu Khoa [Nguyễn Thị Thiều Hoa] <i>The Taylor trigonometric formula, a trigonometric analogue of the Sobolev classes, and trigonometric splines</i> .....	106
Ovcharenko, I. E. <i>Some applications of the Chebyshev recursion</i> .....	111
Sychev, M. A. <i>On a classical problem of the calculus of variations</i> .....	116
Amirov, A. Kh. and Pashaev, R. T. <i>An inverse problem for the wave equation</i> .....	121
Belskii, V. G. <i>A multigrid method for numerical solution of variational inequalities</i> .....	123
Budylin, A. M. and Buslaev, V. S. <i>Quasiclassical integral equations</i> .....	127
Vertgeim, L. B. <i>Integral geometry with a matrix weight, and a nonlinear problem of recovering matrices</i> .....	132
Gerver, M. L. <i>On the matrix <math>F = \{1/[f_i f_j (f_i + f_j)]\}</math></i> .....	136
Il'in, V. A. <i>A componentwise localization principle and componentwise equiconvergence with a trigonometric series for expansions in root vectors of the Schrödinger operator with a matrix potential</i> .....	141
Karatsuba, A. A. <i>The distribution of values of Dirichlet characters on additive sequences</i> .....	145
Liseikin, V. D. <i>On a variational method of generating adaptive grids on <math>n</math>-dimensional surfaces</i> .....	149
Malyshev, V. A. <i>Differential inequalities: imbedding theorems and approximation problems</i> .....	153
Martynyuk, A. A. <i>A new direction in the method of matrix Lyapunov functions</i> .....	157
Matveichuk, M. S. <i>A description of indefinite measures in <math>W^*J</math>-factors</i> .....	161
Rybkin, A. V. <i>The Stieltjes B-integral and the integration of spectral decompositions for some classes of contraction operators</i> .....	166
Samko, S. G. <i>On the denseness of the spaces <math>\Phi_V</math> of Lizorkin type in the spaces <math>L_{\bar{p}}(R^n)</math> with mixed norm</i> .....	171
Tungatarov, A. <i>On continuous solutions of the Carleman-Vekua equation with a singular point</i> .....	175
Filippov, V. T. <i>On local finiteness of Malcev algebras</i> .....	179
Bozhinov, N. S. <i>A necessary and sufficient condition for recovery of functions from their coefficients in the root expansion of the nonlocal Sturm-Liouville operator</i> .....	183
Boimatov, K. Kh. <i>The asymptotic distribution of the eigenvalues of nonlinear pencils of pseudodifferential operators</i> .....	187

Varshamov, R. R. <i>On a method in the theory of reducibility of polynomials over a finite field</i> .....	194
Vinokurov, V. A. <i>The logarithm of the solution of a linear differential equation, Hausdorff's formula, and conservation laws</i> .....	200
Gekhtman, Jr., M. M. <i>On the question of estimates of normalized eigenfunctions of the Sturm-Liouville operator with nonsmooth coefficients</i> .....	206
Gromov, V. P. <i>Nontrivial expansion of zero and representing systems of eigenvectors of a linear operator</i> .....	209
Guliev, V. S. and Lizorkin, P. I. $\mathcal{B}$ - and $\mathcal{L}$ -classes of harmonic and holomorphic functions in the disk, and classes of boundary values .....	215
Dzhangibekov, G. <i>On conditions for the Noether property, and on the index of certain two-dimensional singular integral operators</i> .....	220
Zaslavskii, A. Ya. <i>Optimal trajectories in a model with discrete innovations</i> ..	225
Krasnosel'skii, M. A. and Pokrovskii, A. V. <i>Operators in the problem of forced oscillations in systems with hysteresis</i> .....	228
Salmanov, Yu. D. <i>Traces of functions in weighted classes on manifolds, and inverse imbedding theorems</i> .....	233
Shirinbekov, M. <i>On the theory of the generalized Cauchy-Riemann system of two complex variables</i> .....	237
Shcherbin, V. M. <i>Integration of mappings with values in regular <math>K</math>-spaces</i> .....	243
Agadzhanyan, A. N. <i>Properties of monotone limits of Banach spaces</i> .....	247
Aizikovich, S. M. <i>Asymptotic solution of a class of dual equations for large values of the parameter</i> .....	252
Bozhinov, N. S. <i>Sufficient conditions for the basis property, convergence and summability of a root expansion in a nonlocal Sturm-Liouville problem</i> ..	257
Boimatov, K. Kh. <i>Multiparameter spectral asymptotics for elliptic pseudodifferential operators on compact manifolds</i> .....	263
Bugir, M. K. <i>The connection between the nonoscillatory nature of solutions and ill-posed boundary value problems for fourth-order equations of elliptic type</i> ..	269
Vinokurov, V. A. <i>Change of variables and multiplication of generalized functions</i> ..	273
Konyukhova, N. B. <i>On the limit behavior of a bounded solution of a system of evolution partial differential equations of first order for unbounded increase of time</i> .....	281
Nadirashvili, N. S. <i>Universal classes of uniqueness of domains in the inverse problem of Newtonian potential theory</i> .....	287
Oinarov, R. <i>Weighted inequalities for a class of integral operators</i> .....	291
Rodin, V. A. <i>The <math>BMO</math>-property of the partial sums of a Fourier series</i> .....	294
Sviridyuk, G. A. and Bokareva, T. A. <i>The Deborah number and a class of semi-linear equations of Sobolev type</i> .....	297
Sidorov, N. A. and Blagodatskaya, E. B. <i>Differential equations with a Fredholm operator in the leading differential expression</i> .....	302
Borsuk, M. V. <i>Estimates of solutions of the Dirichlet problem near a corner point for a quasilinear elliptic nondivergence equation of second order</i> .....	306

Dzhuraev, A. <i>On the Cauchy problem for nonhomogeneous Cauchy-Riemann systems</i> .....	309
Epifanov, O. V. <i>Duality of a pair of spaces of analytic functions of bounded growth</i> .....	314
Kazaryan, S. S. <i>Integral inequalities in the spaces <math>L_\omega^\Phi(S^{n-1})</math></i> .....	318
Lavrik, A. A. <i>The strong Titchmarsh conjecture in the discrete theory of the Riemann zeta-function</i> .....	322
Maksimova, L. L. <i>The Beth properties, interpolation, and amalgamability in varieties of modal algebras</i> .....	327
Nikol'skii, S. M. <i>Approximation of functions by trigonometric polynomials on a manifold. I</i> .....	332
Pankov, A. A. <i>On positive solutions of nonlinear elliptic equations in the whole space</i> .....	337
Platonov, V. P. and Rapinchuk, A. S. <i>Abstract characterizations of arithmetic groups with the congruence property</i> .....	342
Serdyukova, S. I. <i>Necessary and sufficient conditions for stability in <math>\mathbf{C}</math> of linear difference boundary value problems of general form</i> .....	348
Chistyakov, S. V. <i>Programmed iterations and universal <math>\varepsilon</math>-optimal strategies in a positional differential game</i> .....	354
Shoikhet, D. M. <i>Some properties of Fredholm mappings of Banach analytic manifolds</i> .....	358
Table of Contents for the next issue (Vol. 44, No. 2, March-April 1992, Russian original Tom 320, nos. 1-6) .....	363-a

Volume 44, Number 2

March-April 1992

---

## CONTENTS

---

Burenkov, V. I. and Tuyakbaev, M. Sh. <i>On Fourier integral multipliers in weighted <math>L_p</math>-spaces with an exponential weight</i> .....	365
Veksler, A. I. and Koldunov, A. V. <i>Countable generalizations of pseudocompactifications and maximal compactifications</i> .....	370
Gel'fand, I. M., Graev, M. I., and Retakh, V. S. <i>Hypergeometric functions on the <math>k</math>th exterior power of the space <math>\mathbf{C}^n</math> and the Grassmannian <math>G_{k,n}</math>, and the connection between them</i> .....	375
Kukushkin, N. S. <i>On the existence of stable outcomes in a game-theoretic model of an economy with social benefits</i> .....	381
Lavrik, A. F. <i>Functional equation of the Riemann zeta-function and a segment of the Euler product</i> .....	386
Makarov, V. L. <i>On a functional-difference method of arbitrary order of precision for solving the Sturm-Liouville problem with piecewise smooth coefficients</i> .....	391

Nikol'skii, S. M. <i>Approximation of functions by trigonometric polynomials on a manifold. II</i> .....	397
Rabinovich, V. S. <i>Spectral properties of a class of difference operators</i> .....	402
Teplyaev, A. V. <i>The pure point spectrum of random polynomials orthogonal on the circle</i> .....	407
Chesnokov, I. Yu. <i>On the structure of a generalized function with support on a subspace</i> .....	412
Bronshtein, M. D. <i>Functionals containing idempotent integration, and their applications to estimating the smallest eigenvalue of differential operators</i> ..	417
Gonchenko, S. V., Turaev, D. V., and Shil'nikov, L. P. <i>On models with a structurally unstable homoclinic Poincaré curve</i> .....	422
Zhizhiashvili, L. V. <i>Solution of a problem of D. E. Men'shov</i> .....	427
Ostapenko, V. V. <i>Expansion of a difference solution at a shock wave front</i> .....	430
Prokhorchenko, V. I. <i>Theorems on the smoothness of periodic solutions of differential equations with singular points</i> .....	436
Rasulov, K. M. <i>On the solution of fundamental boundary value problems of Hilbert type for bianalytic functions</i> .....	440
Sinitsyn, V. I. <i>Finding the multidimensional distributions of the process determined by a stochastic differential equation by the method of ellipsoidal approximation</i> .....	446
Sumin, V. I. <i>Strong degeneration of singular controls in distributed optimization problems</i> .....	453
Khapaev, M. M. <i>Conditions for controllability of singularly perturbed systems containing singular controls</i> .....	459
Abduvalieva, G. K. and Sushko, V. G. <i>Asymptotic representations of solutions of some singularly perturbed problems for equations of mixed type</i> .....	462
Apanasov, B. N. <i>Canonical Riemannian metric on conformal manifolds</i> .....	467
Zhizhiashvili, L. V. <i>Almost everywhere summation of <math>n</math>-fold conjugate trigonometric series</i> .....	471
Igoshin, V. A. <i>Pulverization modelling of quasigeodesic flows</i> .....	474
Larin, V. B. <i>Finding the square root of a positive definite matrix</i> .....	479
Maksudov, F. G. and Aliev, I. V. <i>Differential operator equations of second order with nonregular boundary conditions</i> .....	482
Mardanov, I. Dzh. <i>Construction of the integral manifold of solutions of a system of difference equations</i> .....	486
Norin, N. V. <i>The Itô formula for the extended stochastic integral with randomized time</i> .....	489
Sternin, B. Yu. and Shatalov, V. E. <i>On the Cauchy problem in classes of resurgent functions</i> .....	496
Subbotina, N. N. <i>The method of Cauchy characteristics and generalized solutions of the Hamilton-Jacobi-Bellman equation</i> .....	501
Fazano [Fasano], A., Primicerio [Primicerio], M., and Radkevich, E. V. <i>Transitional zone problems</i> .....	507
Shneiberg, I. Ya. <i>The exponential Radon transform</i> .....	512

Karapetyants, N. K. and Yakubov, A. Ya. <i>A convolution equation with power nonlinearity of negative order</i> .....	517
Klyachin, A. A. and Miklyukov, V. M. <i>Space-like hypersurfaces and the problem of extending functions with constraints on the gradient</i> .....	521
Krasovskii, A. N. <i>Control under minimax of an integral functional</i> .....	525
Kudaev, M. B. <i>Nonoscillation and monotonicity of solutions of a differential equation</i> .....	529
Kudryavtsev, L. D. <i>Boundary value problems for ordinary differential equations with data at infinity</i> .....	532
Kudryavtsev, L. D. <i>Existence and uniqueness of solutions of ordinary differential equations with initial data at infinity</i> .....	539
Kurta, V. V. <i>On some qualitative properties of solutions of an equation of mean-curvature type</i> .....	544
Pokhozhaev, S. I. <i>On the asymptotics of entire radial solutions of quasilinear elliptic equations</i> .....	548
Sinitsyn, I. N. and Shin, V. I. <i>Conditionally optimal filtering of processes in stochastic differential systems by complex statistical criteria</i> .....	554
Sinitsyn, I. N. and Shin, V. I. <i>Estimation of the state and parameters in discrete stochastic systems by complex statistical criteria</i> .....	558
Skrypnik, I. V. <i>A condition for regularity of a boundary point for a higher order quasilinear elliptic equation</i> .....	562
Sternin, B. Yu. and Shatalov, V. E. <i>On the notion of elementary solution in the complex theory of differential equations</i> .....	567
Tazhimuratov, I. T. <i>On the reducibility of systems of linear first-order partial differential equations with the same principal parts</i> .....	572
Khakhlyutin, V. P. <i>On a problem of integral geometry in the plane</i> .....	574
Akbarov, D. E. and Ivanenko, V. I. <i>On extremal problems for equations of Hammerstein type</i> .....	577
Gol'dman, M. L. <i>On integral inequalities on a cone of functions with monotonicity properties</i> .....	581
Dzhuraev, A. <i>On a degenerate boundary value problem in space</i> .....	588
Maksudov, F. G. and Sadygov, M. A. <i>A subdifferential of higher order</i> .....	594
Smolyak, S. A. <i>On the question of defining the mean</i> .....	599
Bronshtein, M. D. and Samborskii, S. N. <i>A multicriterion variational method for systems of nonlinear partial differential equations</i> .....	603
Gabasov, R., Kirillova, F. M., and Kostyukova, O. I. <i>Construction of optimal controls of feedback type in a linear problem</i> .....	608
Dzhuraev, A. <i>On an overdetermined first-order elliptic system</i> .....	614
Dzhuraev, T. D. and Abdinazarov, S. <i>On the theory of odd-order equations with multiple characteristics</i> .....	619
Kolokol'tsov, V. N. <i>Introduction of a new Maslov-type currency (coupons) as a means of solving a market game under nonequilibrium prices</i> .....	624
Kucher, N. A. <i>On a convergent decomposition scheme for the multidimensional equations of a viscous gas</i> .....	630

Rustamov, Kh. P. <i>On approximation of functions on a sphere</i> .....	635
Sitnik, S. M. <i>Factorization and estimates of the norms of Buschman-Erdélyi operators in weighted Lebesgue spaces</i> .....	641
Table of Contents for the next issue (Vol. 44, No. 3, May-June 1992, Russian original Tom 321, nos. 1-6) .....	646-a

Volume 44, Number 3

May-June 1992

---

CONTENTS

---

Kruglov, V. E. <i>On algebraic functions that are multiples of a given divisor</i> .....	647
Matveev, O. V. <i>Approximation properties of interpolating <math>D^m</math>-splines</i> .....	650
Mishnaevskii, P. A. and Ramm, A. G. <i>A uniqueness theorem for a problem of Goursat-Darboux type</i> .....	656
Rustamov, Kh. P. <i>On the equivalence of some moduli of smoothness on the sphere</i> .....	660
Doktorskii, R. Ya. <i>Reiteration relations of the real interpolation method</i> .....	665
Domanskii, E. N. <i>On continuous Maslov regularizability of ill-posed problems</i> .....	670
Korovina, M. V., Sternin, B. Yu., and Shatalov, V. E. <i>Asymptotic expansions "in the large" of solutions of the complex Cauchy problem with singular initial data</i> .....	674
Romanov, V. G. <i>Uniqueness theorems in inverse problems for some second-order equations</i> .....	678
Serkov, D. A. <i>Strongly optimal strategies</i> .....	683
Kheifits, A. I. <i>The Riesz-Herglotz formula for generalized harmonic functions and their boundary behavior</i> .....	688
Belyi, S. V. and Tsekanovskii, È. R. <i>Classes of operator <math>R</math>-functions and their realization by conservative systems</i> .....	692
Golovin, V. D. <i>On Fréchet sheaves over a holomorphically complete complex space</i> .....	697
Kuzin, I. A. <i>On multiple solvability of some elliptic problems in <math>\mathbb{R}^N</math></i> .....	700
Kurzhanskii, A. B. and Filippova, T. F. <i>On the method of singular perturbations for differential inclusions</i> .....	705
Leonov, A. S. <i>On the accuracy of Tikhonov regularizing algorithms and quasioptimal selection of a regularization parameter</i> .....	711
Lyakhov, L. N. <i>Inversion of Riesz <math>B</math>-potentials</i> .....	717
Makarov, V. L. and Khlobystov, V. V. <i>Polynomial interpolation of nonlinear functionals</i> .....	721
Nakhman, A. D. <i>Marcinkiewicz-type means of polynomial Fourier expansions</i> .....	726
Novruzov, A. A. and Mamedov, F. I. <i>On the smoothness of solutions of degenerate quasilinear elliptic equations of second order</i> .....	730
Filippov, V. V. <i>On asymptotic integration of ordinary differential equations with discontinuities in the right side</i> .....	734

Chikrii, A. A. and Rappoport, I. S. <i>Group pursuit for controlled objects with different time lag</i> .....	739
Bartochchi, K. [Bartocci, C.], Brudzo, U. [Bruzzo, U.], Pestov, V. G., and Èrnandes Ruiperes, D. [Hernández Ruipérez, D.] <i>On an axiomatic approach to supermanifolds</i> .....	744
Bloshanskii, I. L. <i>Weyl multipliers and the growth of the partial sums of rectangularly summable multiple trigonometric Fourier series</i> .....	749
Bratishchev, A. V. <i>A basis of exponentials in a half-plane and in a strip</i> .....	753
Gadzhiev, F. A. and Rubinov, A. M. <i>Models of economic equilibrium in the presence of superlinear connections</i> .....	757
Dzhuraev, A. <i>On the theory of overdetermined systems of first order</i> .....	762
Kel'zon, A. A. <i>On functions of <math>(m, \Phi)</math>-bounded variation</i> .....	768
Maksudov, F. G. and Aliev, F. A. <i>On a problem for a nonlinear hyperbolic equation of higher order with dissipation on the boundary of the domain</i> .....	771
Mikhailichenko, G. G. <i>Dimetric physical structures and complex numbers</i> .....	775
Mikhailov, L. G. <i>On a property of singular differential equations</i> .....	779
Pyatnitskii, E. S. and Rapoport, L. B. <i>The boundary of the domain of asymptotic stability of selector-linear differential inclusions, and the existence of periodic solutions</i> .....	785
Rabinovich, V. S. <i>Singular integral operators on a complex contour with oscillating tangent, and pseudodifferential Mellin operators</i> .....	791
Budaev, V. D. <i>A necessary condition for the Riesz basis property of systems of root functions of ordinary differential operators</i> .....	797
Burgin, M. S. and Borodyanskii, Yu. M. <i>Infinite processes and superrecursive algorithms</i> .....	800
Vasilets, S. I. and Kilbas, A. A. <i>On the solution of integral equations of the first kind with weak singularities in an <math>n</math>-dimensional spherical shell</i> .....	804
Dzhuraev, A. <i>On some nonelliptic overdetermined systems of first order and their application</i> .....	809
Ivashkovich, S. M. <i>Theorems of Hartogs type for meromorphic mappings, spherical shells, and the complex Plateau problem</i> .....	816
Kireitov, V. R. <i>The Dirichlet problem for the equation <math>\Delta^{1/2}u = f</math> in a domain with compact regular boundary</i> .....	820
Mel'nik, V. S. <i>On noncoercive extremal problems in Banach spaces</i> .....	824
Nurekenov, T. K. <i>Conditions for complete continuity of an Uryson integral operator</i> .....	830
Sternin, B. Yu. and Shatalov, V. E. <i>On the global solvability of the Cauchy problem in spaces of ramified analytic functions</i> .....	836
Aizenberg, L. A. and Kytmanov, A. M. <i>Holomorphic extension of functions from part of the boundary of the domain</i> .....	839
Bloshanskii, I. L. <i>Correlation between the structure and geometry of sets of unbounded divergence and a method of summing a multiple Fourier series of a function in <math>L_p</math>, <math>p &gt; 1</math>, that is equal to zero on a certain set</i> .....	843

Boimativ, K. Kh. <i>Multiparameter spectral asymptotics for elliptic systems of differential operators in arbitrary domains of finite measure</i> .....	848
Volkov, E. A. <i>On a fast method of computing the Green function of the Laplace operator on polygons</i> .....	854
Gutlyanskii, V. Ya. and Ryazanov, V. I. <i>On representation of solutions with singularities for a generalized Cauchy-Riemann system</i> .....	858
Kapustin, N. Yu. and Sabitov, K. B. <i>On uniqueness of solutions of the generalized Tricomi problem arising in the theory of the Laval nozzle</i> .....	862
Pletner, Yu. D. <i>On fundamental solutions of operators of Sobolev type</i> .....	866
Skubachevskii, A. L. and Steblov, G. M. <i>On the spectrum of differential operators with domain of definition not dense in <math>L_2(0, 1)</math></i> .....	870
Table of Contents for the next issue (Vol. 45, No. 1, July-August 1992, Russian original Tom 322, nos. 1-6) .....	875-a